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Studies on Enzootic Staphylococcal Infection in Lambs Associated With Tick-Bite

II.—The Bacteriology of the Disease

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The first paper of this series (McDiarmid, 1946) dealt with the nature of enzootic staphylococcal infection in lambs and described the clinical and pathological findings. The present paper, the second of the series, describes the morphological, cultural, biochemical, serological and pathogenic characters of staphylococci isolated by Dr. W. S. Gordon in the spring of 1940, from lambs affected with pyaemia on hill farms in Perthshire. Typing was commenced in the autumn of the same year.

Materials and Methods

SOURCE OF STRAINS. Nineteen strains were isolated from 14 lambs affected with pyaemia. These strains were labelled according to the serial number of the affected lamb and the organ from which the cultures were isolated, *viz.*:—

19L	(Liver)	115S	(Spleen)
71L	(Liver)	118Lg.	(Lung)
82L	(Liver)	118Ht.	(Heart)
84L	(Liver)	132K	(Kidney)
89L	(Liver)	134L	(Liver)
89H	(Hockjoint)	691F	(Fetlock)
90J	(Jaw abscess)	691L	(Liver)
100L	(Liver)	691Ke	(Knee)
106P	(Pericardium)	691T	(Thorax)
113K	(Kidney)		

The cultures were maintained on sheep blood agar slopes and subcultivations were made at monthly intervals. Each of the strains was examined by the following methods.

GELATIN LIQUEFACTION. Liquefaction of gelatin was studied both on gelatin plates and in gelatin stab cultures, which were incubated for one week at room temperature.

CHROMOGENESIS. The chromogenic characters were compared on four different types of media, *viz.*, nutrient agar, Loeffler's serum, potato slants and 33 per cent. milk agar (Christie and Keogh, 1940). The temperature and duration of incubation was varied with each medium.

FERMENTATION REACTIONS. Fifteen carbohydrates were employed and Andrade's indicator was used. The tests were read at seven days with the exception of glycerol, in which readings were taken at four days.

LITMUS MILK. The strains were grown in this medium for seven days at 37° C.

METHYL RED AND VOGES-PROSKAUER TESTS. The methods used were those described by Topley and Wilson (1941).

In addition, the strains were examined for *nitrate reduction* by the *Greiss-Ilosva* technique, the *production of ammonia* by Nessler's Reagent, *production of indole* by Holman and Gonzales' method (1923) and finally the *production of hydrogen sulphide* by growth on lead acetate medium.

COAGULASE TESTS. The plasma was obtained from citrated human, rabbit, sheep and horse blood. A loopful of agar-grown culture suspended in normal saline was added to 0·5 ml. of each type of plasma, the mixtures incubated at 37° C. and results read at three, five and 24 hours.

PATHOGENICITY. Young mice of both sexes, approximately 20 g. in weight were used. The cultures were grown on plain agar slopes overnight to avoid the presence of toxins in the resulting suspensions. The growth was washed off in normal saline, standardized to an opacity matching No. 8 tube on Brown's scale and groups of mice were injected subcutaneously, intravenously and intraperitoneally with graded doses of the suspensions ranging from 0·3 ml. to 0·00001 ml. With each dose used, two mice were injected subcutaneously and three by the two other routes.

HAEMOLYSIS AND TOXIN PRODUCTION

(*a*) *Haemolysis.*—All the strains were examined for haemolytic activity on 5 per cent. blood agar plates. Three types of blood were used, *viz.*, rabbit, sheep and horse. Cultures of the organisms were grown overnight in nutrient broth and a loopful of each was dropped on to the plate according to the method of Bryce and Rountree (1936).

(*b*) *Toxin Production.*—The standard Walbum medium was used and the following technique adopted.

Fresh 16-hour broth cultures were used as inocula and the Walbum's medium was incubated at 37° C. in an atmosphere containing 20 per cent. CO_2 for nine days; the CO_2 content was adjusted every second day. The cultures were finally centrifuged and the supernatant fluid pipetted off. This constituted crude toxin.

The toxins so produced were tested for:—

(1) Haemolysin production (Bigger, 1933) in which descending dilutions of toxins were mixed with 1 per cent. sheep red blood corpuscles.

(2) Lethal effect on mice by intravenous injection, the inoculum being kept constant at 0·5 ml. irrespective of the quantity of toxin present.

(3) Necrotic action on the skin of depilated guinea-pigs which were injected intradermally with 0·1 ml. of varying dilutions of toxin.

AGGLUTINATION AND CROSS-AGGLUTINATION TESTS. Only the pathogenic strains were examined.

Preparation of Sera.—Rabbits received nine intravenous injections of formalinized cultures according to the scheme of Cowan (1939). Blood was withdrawn seven days after the last injection and the sera tested for agglutinins against their respective antigens; cross-agglutination tests were also carried out.

Antigen.—This consisted of a suspension in normal saline of organisms grown for 24 hours on plain agar slopes; this suspension was standardized to an opacity matching Brown's tube No. 6.

Dilutions of Serum.—The ordinary tube test was used, the final serum dilutions being 1/30, 1/60, 1/120, etc. The tubes were incubated for 20 hours at 37° C. and the titre was taken as the highest dilution of serum showing definite agglutination.

Results

The main differences between the strains are shown in Table I. All were Gram positive and possessed the morphological characters appropriate for staphylococci.

TABLE I

PRINCIPAL DIFFERENCES BETWEEN STRAINS

Haemolysin and toxin production	No toxin produced	β toxin	$\alpha\beta$ toxins
Strains	82L, 89L, 90J, 118 Ht.	71L, 691F	Remaining 13 strains
Chromogenesis			
Potato (9 days)	V.P.O.	O	O
33 per cent. milk agar (4 days)	P.Y.F.	O	O
Fermentation (acid no gas)			
Galactose	+	+	+ (1)
Lactose	+	+	+ (2)
Glycerol	+	—	—
Salicin	+	—	—
Litmus Milk (acid and clot) ..	+	+	+ (3) (4)
Voges Proskauer	—	+	+
Coagulase (human plasma) ..	—	+	+
Pathogenicity for Mice	—	+	+

V.P.O. signifies very pale orange. (2) signifies Strain 100L negative.
P.Y.F. " pale yellow fawn. (3) " "
O " orange. (4) " Strain 118 Lg. produced acid only.
(1) " Strain 100L negative.

CULTURAL TESTS. Gelatin was liquefied by every strain, although the degree of liquefaction varied with different cultures. Subsequent results showed that rapid and extensive liquefaction of this medium did not necessarily indicate pathogenicity since 82L, which was finally typed as non-pathogenic, caused rapid liquefaction of gelatin. Pigment production was found to vary considerably accord-

ing to the medium, the temperature and duration of incubation employed. The best results were obtained with 33 per cent. milk agar, readings being taken after two days at 37° C. followed by two days at room temperature. Growth on potato slants showed marked colour production provided the cultures were left at room temperature for periods up to seven days after the initial incubation at 37° C. for 48 hours. With the exception of four, 82L, 89L, 90J and 118Ht., all the strains produced orange pigment on all types of media. The four exceptions produced a pale yellow fawn pigment on most of the media employed. It may be noted, however, that these four strains were still capable of producing a slight degree of orange pigmentation if grown for nine days on potato slants. Strain 118Ht. is of special interest because when first isolated it was pathogenic and capable of producing orange pigment but, after a few sub-cultures, it became a pale-coloured strain and lost its pathogenic character. The following carbohydrates were fermented by every strain: maltose, glucose, sucrose, mannitol and mannose; 100L was the only strain which failed to ferment lactose and galactose. No strain acted on inulin, raffinose, dulcitol, sorbitol, erythritol and xylose. Only four strains, 82L, 89L, 90J and 118Ht., fermented glycerol and salicin.

In litmus milk the clotting time was variable but the production of acid and eventual clot was constant for 17 of the 19 strains. Strain 100L failed to act on this medium and 118Lg., although producing acid, did not clot the milk. Every strain was methyl red positive and with four exceptions, namely, 82L, 89L, 90J and 118Ht., all were Vosges-Proskauer positive. Every strain reduced nitrates and produced ammonia but no strain produced indole or hydrogen sulphide.

Coagulase Tests. Fifteen of the 19 strains were coagulase positive. The four coagulase negative strains were 82L, 89L, 90J and 118Ht. Human and rabbit plasma gave the best results whereas sheep and horse plasma were unsatisfactory.

Pathogenicity. The results of the mouse pathogenicity tests are summarized in Table II.

Table II

Mouse Pathogenicity Tests

Non-pathogenic strains	82L, 89L, 90J, 118H					
Remaining 15 pathogenic strains	Dose					
	0·3 ml.	0·1 ml.	0·01 ml.	0·001 ml.	0·0001 ml.	0·00001 ml.
Intravenous route	..	+	+ Except 132K 134L	— Except 19L 84L 100L 106P 691L 691T	—	—
Intraperitoneal route	..	— Except 19L 84L 106P 115S 118L 134L 691Ke 691T	—	—	—	—
Subcutaneous route	+ Except 71L 100L 132K 691L	— Except 19L 106P 113K 115S 118Lg 691T 691Ke	—	..	..	..

+ signifies death of mice. — signifies survival of mice.
.. signifies not injected.

Again the aberrant strains 82L, 89L, 90J and 118Ht. were shown to be non-pathogenic whereas the remaining strains were pathogenic by one or more of the inoculation routes employed. The subcutaneous inoculations gave rise to abscess formation, with considerable necrosis, at the inoculation sites, but no pyaemic lesions developed. Typical pyaemia was produced by intravenous injection, the changes in the various organs closely resembling those encountered in natural cases in lambs. The kidney tissue was the principal site of infection in this group, and costochondral and myocardial abscesses were noted in most cases. The liver substance was infected on three occasions. Mice appeared to be much more resistant to infection by the intraperitoneal route, in which the *post-mortem* appearance suggested that death had resulted from toxaemia due to the proliferation of organisms in the peritoneal cavity. The only macroscopic lesions observed were extensive suppurative peritonitis and occasional abscesses on the visceral surface of the liver.

Attempts were made to isolate staphylococci from blood obtained during life from the tail veins of all injected mice. Staphylococci were not obtained from any mouse in the subcutaneous or intraperitoneal groups, whereas mice inoculated intravenously yielded cultures at irregular intervals. This is similar to the naturally occurring disease in the lamb in which the organisms rapidly leave the systemic circulation, localize in the organs and joints and produce bacteraemia at irregular intervals.

Haemolysin and Toxin Production. The majority of the strains showed the α β type of haemolysis on blood agar medium (Glenny and Stevens, 1935). The four non-pathogenic strains, namely, 82L, 89L, 90J and 118Ht., were non-haemolytic. 71L and 691F produced β haemolysis. In Walbum's medium, similar results were obtained; 13 strains gave high haemolytic titres *in vitro*, produced necrosis of the skin of guinea-pigs and were lethal to mice. With certain batches of toxin, strains 19L, 106P and 115S killed mice in a dose of 0·0125 ml. intravenously. Other strains killed regularly with 0·025 ml. The smallest quantity of toxin which would produce skin necrosis in guinea-pigs was 0·0063 ml. of strain 19L or 115S.

The four non-pathogenic strains already mentioned, failed to produce haemolysis *in vitro*, failed to produce necrosis of the skin in the guinea-pig and were not lethal to mice. Strains 71L and 691F produced a marked "hot cold" lysis *in vitro*, practically all the lysis occurring after the tubes had been removed from the incubator; they also produced only a faint flushing on the skin of a depilated guinea-pig in a dose of 0·1 ml.

Agglutination Tests. All the sera produced from rabbits inoculated with the pathogenic strains agglutinated their corresponding antigens and, in addition, agglutinated the other pathogenic types with the exception of 71L. The serum produced from this strain agglutinated only strains 71L and 691L. The agglutination titres obtained in these tests varied from 1/240 to 1/15,360. Against their own specific antigens, the sera usually gave high titres, *e.g.*, serum 691F agglutinated strain 691F in a dilution of 1/15,360. The average titre for all the strains was approximately 1/1000.

DISCUSSION

It will be observed from Table I that the organisms isolated from cases of pyaemia in lambs could be divided into three groups, *viz.*:—

1. Fully virulent strains with very consistent characteristics except for strain 100L which failed to act on lactose, galactose and litmus milk.
2. Strains which produced β toxin only and which, in one case, showed some abnormality with regard to agglutination.
3. Non-virulent strains, lacking both α and β toxins and distinguishable from the other strains by a variety of tests.

The strains in Group 1 appear to be indistinguishable from typical α β *Staphylococcus aureus* but Groups 2 and 3 may consist of other varieties of staphylococcus or of degenerate strains of *Staphylococcus aureus*. The latter possibility is supported by the fact that 118Ht. and 118Lg., both pure cultures from the same animal, differ in their cultural and pathogenic properties; moreover, 691F also differs from the other 691 strains and, as already mentioned, 118Ht. changed in character shortly after original isolation. The view held by the author is, therefore, that these strains should be regarded as imperfect strains of *Staphylococcus aureus* which have lost some of their original characteristics as a result of sub-cultivation on artificial medium.

Summary

Nineteen strains of staphylococci were isolated from 14 lambs affected with pyaemia. Thirteen were classified as virulent strains of *staphylococcus aureaus*, two were deficient in α toxin and four were avirulent and did not produce α or β toxins. These strains could be distinguished by a variety of tests. The view is expressed that the strains deficient in one or both toxins were not another species of staphylococcus but represented strains that had lost some of their virulent characters as a result of sub-cultivation.

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Visual Aids in Veterinary Education*

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The present methods of teaching veterinary science, as we are all doubtless aware, have not been without criticism from time to time and from various quarters. While subscribing to all means of forwarding progress I am not one who decries the quality of the teaching which is given at the present day in our colleges. I believe that such teaching, if considered in the light of all relevant circumstances, compares favourably with that given to the members of any of the professions comparable with our own. Fortunately it is not my province to argue the case for or against the one-portal system of entry into the profession, for or against rearrangement of the curriculum, or for or against any one of the major issues which now are, or perhaps will be, with us perennially. I have the much less abstruse and, I hope, more satisfying task of dealing merely with some of the aids we can employ as an integral part of our present teaching programme. As you will see, I propose to deal in this respect only with the limited field presented by visual aids to veterinary education and further to restrict my remarks even then practically entirely to the potential role of the motion film in that field.

Visual Education

Visual aids to education are no novelty. All of us remember the tales of our youth when, encouraged by our mentors, we cast our minds back graphically over a span of 2,000 years or so and saw vividly in our imaginations the great mathematicians, the early physicists, the philosophers and all the rest tracing out their theories and theorems in the sand, and all of us know that from time immemorial graphic symbolism has been a means of imparting knowledge which has never failed in its purpose. As Vaughan Thomas (1945), the headmaster of Barnet Day Continuation School, has recently pointed out, we start the child's journey through the complexities of life by calling upon visual aids on every occasion. There is, surely, therefore, something to be said for continuing and extending a process which is at once pleasurable and exciting. Language itself, in its written form, is, after all, merely a set of symbols by means of which is conveyed in pictorial fashion the visual image lying behind the words. Time and conventional usage have added to the mnemonic relevance of the written word. Words now obscure as much as they reveal and our vocabulary is inadequate to do exact justice to the terminology of our studies in many subjects. The mathematicians are to be envied in their possession of exact symbols stripped of the complications of emotional association and content. As a child I was taught to read by the phonetic method. Ca, ää te, was cat, and so on. A few days ago the headmistress of the modern kindergarten at which my young son is a pupil, told me in response to my curious questioning, that the phonetic method of teaching infants to read had now largely been replaced by the visual method. Thus, as Vaughan Thomas points out, we have reached the ironical position that we teach our children the sounds of the alphabet by associating relevant pictorial matter with the shape of the letters. In other words, we use a set of recognizable symbols to interpret another set of symbols whose origin is too far hidden from us to allow of any primary direct and automatic pictorial association.

Education has been described as the organization of experience. If that is so, then the most profitable and, indeed, sometimes the only technique we can employ in relation to it is the visual one.

The visual approach is no substitute for the lecture, the merits and demerits of which are so ably discussed by Bruce Truscot in "Redbrick University." Properly used, the visual aid is an integral part of the lecture, transforming it, as Aitken (1945) has recently said, "From at its worst a dull summary of a text-book droned by a lecturer and mechanically copied down by a class, to at its best a vivid discourse that conveys matter, argument, and an attitude of mind, appealing to the eye from blackboard and screen, and relaxing the student's attentive face in an occasional smile."

The cumulative mass of written knowledge in the sciences alone is terrifyingly large. Yet in the teaching of veterinary medicine as in many other specialized fields, experience shows that a wide general knowledge is the basis of future success. A namesake of my own, W. H. Ogilvie (1945), in dealing with the education of the surgeon in human medicine, has given it as his opinion that the man with broad knowledge and wide cultural interest in many related fields will probably make a better surgeon than one whose chief claim to distinction is that he can give facts in parrot fashion. This broad view is, I am sure, equally true in the veterinary field and if we subscribe to it we must employ all necessary aids to widen the scope of relevant scientific interest. With the ever extending fields exposed by accelerated modern progress I would submit that modern visual aids are the only possible means of performing this function.

Apparatus, Etc.

Having dealt in somewhat cavalier fashion with the general case for using visual aids in education, I should like, if I may, to turn for a short time to consideration of the actual aids themselves. We have at our disposal in this respect the diascope, the episcope, the sound film projector, the silent film projector, and the film-strip projector. With these we can show slides, photographs, charts, diagrams, sound and silent films and film strip. Of these I shall here deal, as I have said, only with films, but in passing I feel that I should draw attention to the recent work with the so-called Isotype Method of Education recently described by Neurath (1945) where symbolism in the form of familiar objects is used instead of words to convey information. This method has been criticized by some writers but seems applicable in many respects to veterinary teaching and is worthy of study.

Films

Films themselves and their use in teaching the sciences is a very large subject which can be no more than touched upon here. If I were asked to try to sum up the position in a few words, I feel that I could do no better than say in the first place that a small amount of film material is first-class, a lot needs drastic pruning, and much is haphazard; in the second place that mere showing of films is not enough to teach a subject; and thirdly that the use both of sound and colour in films is a complicating factor since they have arrived before the great mass of teachers have made up their minds about the whole question of the place which films may take. Teachers in universities are notoriously conservative. As Aitken has said, "University teachers are not trained as teachers—they just teach," and in my experience, inheriting as they do the traditions of their institution, they teach largely according to tradition. In the veterinary schools and in a wider sense within the ranks of the profession we are, I think, more progressive. Witness of this is the quick action of the N.V.M.A. in appointing a committee to consider the whole question of veterinary films (1945) and even more recently the information which has reached me that the R.C.V.S. has agreed to consider the formation of a veterinary film library as part of its excellent pre-war library service. In Manchester, Miss Anne Shaw, an expert in the new science of motion study in industry, who is the only woman member of the Cripps Cotton Working Party, when asked about the future prospects of her science, quoted a Swiss philosopher who said that when any new idea is introduced, it passes through three stages. First, people said it was contrary to the teaching of God, then they said it would not work, and thirdly they maintained that they had always known it was right. I believe that so far as the extensive use of films in the teaching of veterinary medicine is concerned we are rapidly approaching the third phase in this respect.

I do not propose to deal at all with the technicalities of biological film production. I have no real qualifications for such a task and in any case this subject has been fully covered elsewhere by my colleague, Dr. Yule Bogue (1944) who, as you are doubtless well aware, has had extensive experience and is acknowledged as one of the foremost experts in this field. I would stress, however, that it is the advances in technique and resultant general improvement in the quality of films which have really reopened the whole consideration of this subject. Motion films are no novelty, even in the biological sphere. The first one which was made in that field is now 50 years old and since then many hundreds of films have been made. Dr. Brian Stanford, who is cataloguing medical films on behalf of the Royal Society of Medicine in London, tells me that there are upwards of 1,000 medical films in Britain and a few investigations which I have made on the veterinary side indicate that there are perhaps 400 films of direct or comparative veterinary interest in the country. Of these, comparatively few deal expressly with purely veterinary subjects. In America a catalogue of veterinary films has been made by Miss Florence Harden, now librarian of the U.S. Army library in Washington. Miss Harden informs me that this catalogue lists some 550 American veterinary films and that it has been passed over to the American Veterinary Medical Association, who some time ago set up a film committee. This committee has been very active and as can be seen from recent announcements in the American Press, is stimulating great interest in veterinary film matters. For example, film notifications in the *Journal of the American Veterinary Medical Association* (1945) during the last few months in this respect include: Foot-and-Mouth Disease,

* Address delivered at the Annual Prizegiving, Veterinary College of Ireland, Dublin, October 23rd, 1945 (condensed).

Gastric Fistula Technique and the Interior of the Bovine Stomach, and Sentinels of Milk.

These films are in sound and colour and, with the possible exception of the last named, are made expressly for the technical audience. It is perhaps of interest to note in passing that MacKeith (1945), who has himself catalogued many scientific films and is the author of the list recently mentioned in *The Veterinary Record* (1945), has criticized the American efforts in these terms: "It is commonly thought that the U.S.A. have some good films, but the best examples seen over here are disappointing. They are usually long and diffuse and are not suited to our methods of teaching."

Why then, you will ask, is it that films have, to date, been so little used in teaching? The answer surely is, quite apart from tradition and other factors which I have mentioned, that so very few worthwhile teaching films have ever been made. This in turn has really been due to the fact that little planning of production has ever taken place and because the aid of the professional film maker has not until recently been evoked. Newman (1945), writing recently on the subject, sums up the position by saying: "The trouble is that so few good films have been made. When one compares what can be seen in the ordinary amateur film on an operation with, for instance, the film on chest surgery produced by the Ministry of Information, one realizes what could be done if film professional technical skill is applied."

[Films depicting the following were then projected: Bovine Mastitis, Life Cycle of Fasciola (Liver Fluke), Endotracheal Anaesthesia, Laparotomy and Obstetrical operations. In addition, part of an old film to show the defects of early cinematography and a special film prepared by Dr. Yule Bogue to illustrate special filming techniques were shown.]

That there are many technical advances still to be made in the making of scientific and other films cannot be denied, but already there are sufficient points of technical development to merit more consideration of them than has been given to date. For example, I should like to emphasize the outstanding possibilities of X-ray cinematography, particularly in teaching the manipulative and anatomic sides of veterinary medicine. I saw some of the first of these X-ray cinematography films used for teaching purposes in Edinburgh University more than ten years ago and I am sure that, had it not been for limitations imposed by the war, films of this type would have been widely employed both for teaching and in some conditions probably as aids in diagnosis. Of outstanding importance there are the questions of what types of scientific film will best suit certain types of audience and whether or not in scientific films the many artifices of the commercial film makers should be employed. On an audience basis veterinary films may be for the general public, for the farmer, for the veterinary student, or for the graduate veterinarian. Any one film naturally grades in many cases into two or more categories, but it is essential, in my view, that when the film is being planned the audience for whom it is intended should be clearly in mind. The commercial film industry so far is the only agency which has dealt at all, and that very imperfectly, with films relating to veterinary science for the general public. In this respect it is perhaps worth noting that a film on the doctor's day has recently been produced under medical auspices, that the Pharmaceutical Association are taking steps to produce a film on the work of the pharmacist, and that the National Farmers' Union (1945) has now announced that it proposes to use the film as publicity for the farmer. We in the veterinary profession are really little known to the average man in the street and we will be wise to give consideration to the use of motion pictures to let him see what sort of work we do and to put him in a better position than at present to appreciate the contribution to his welfare which we can make.

With regard to the so-called commercial artifices, one of these which has been brought to a fine art by the great commercial film companies is the use of music in films. Music invariably crashes and rolls through all the epics which the 25,000,000 picture-goers see each week in Britain, for example. Yet, if you ask, not one in a million can recall any of the characteristics or even the nature of the music ten minutes after the film has ended. Ask yourself whether or not there was a musical accompaniment to the picture you saw last week, and I would wager that unless it was a musical comedy or something of that nature, you will not be able to answer. Yet music no doubt played quite loudly throughout. It is in fact the recognized method of touching the emotions and to watch its use in this way in the modern commercial film is an absorbing study. Music, because of its effect on the emotions, is frequently employed to create a mood or a sense of association with certain countries or localities. To my mind, because of this, music is an effect which is very necessary to provide a background and atmosphere for scientific films for lay audiences, but for the scientific audience already full conscious of these factors, music is merely a diversion and should not be employed.

Two other technical points that are of moment are the use of sound and the use of cartoons. With regard to the use of sound, I believe, for reasons which I will not detail here, that for films for universal use in teaching, the silent version is generally best, but much will depend on the preference of the individual teacher.

The cartoon or animated diagram has come greatly to the forefront due to the labours of Mr. Disney and others and merits full consideration. It is a most effective method of conveying information. Indeed I have seen it stated that the silent cartoon film is the best of all teaching media, although for myself I would prefer a mixture of diagrams and real pictures.

Finally, we must give consideration to the use of colour in teaching films. To my mind the difference in effect between black and white and coloured films is remarkable. Most people have rather a poor impression of the "glorious technicolour" used to glamorize Miss Betty Grable and her co-workers. But colour properly used can show changes in tissues impossible to illustrate with black and white. The use of colour vitalizes scientific films and in my opinion takes them in the mind from the realm of photography into near actuality.

And now a last word on films in general. Kleitman (1945) has described experiments in which he has demonstrated that during a showing of films the temperature of his audience rose ½ to 1° F. Sitting for the same length of time without pictures almost always led to a distinct fall in temperature—an expected result of muscular relaxation. It thus appears that attending the pictures is by no means relaxation in the physiological sense. It remains to be seen whether the collective change in the body temperature of a preview audience can be used to predict the box office success of a film or whether a similar change in a body of veterinary students can be utilized by the ultra-modern teachers of the future to assess whether or not any teaching film has put over its message in full or in part. All that is nebulous. What, to my mind, is much more certain, is that films in full colour, in stereoscopic presentation, in sound, in all the future advances which are to come, will take their full place as aids in the teaching of veterinary medicine.

The student of the future, I believe the near future, will at least be secure in the knowledge that he can see all that there is to be seen and will no longer be conscious, as many of us are conscious, that many of the conditions about which we talk so learnedly have never been within our vision. Seeing is believing, and for much of our science seeing is also knowing. It is of the utmost importance that we see for ourselves in the living animal and in the cadaver all that we can, but recognizing our own limitations in time and space, we will do well to allow the roving eye of the camera to bring us faithful images which otherwise we could not see. To this view I commend your attention now and in the future.

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THIAMINE HYDROCHLORIDE IN ACETONAEMIA

Dr. D. R. Haney, Butler, Missouri, reports the use of thiamine hydrochloride in treatment of seven cases of bovine acetonaemia. A single subcutaneous injection of solution containing 500 milligrams (166,600 international units) thiamine hydrochloride (vitamin B_1) resulted in uneventful recovery in five cases. One case required a second injection to bring about recovery, and one case did not respond to this treatment.

All of these cases were diagnosed by use of the urine test for ketone bodies. One of the cases was of the "crazy" type—she was chewing the manger, was very excitable and difficult to restrain long enough for examination and treatment. Twelve hours after treatment the cow appeared normal and gave nearly the normal milk flow.—*Norden News*.

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Weekly Wisdom

The veterinarian must have a sense of responsibility and a realization of obligation to his community as well as to his client.
—Dr. S. Elmer.

CLINICAL COMMUNICATION

Rhythmic Myoclonic Spasms in Dogs*

MARCUS M. MASON

With the kind permission of the President of this Society, I should like to present a case for discussion. I have brought this bitch for your observation and comments. The case is neither peculiar nor outstanding. It is presented as a typical case which is usually disposed of by the simple expedient of euthanasia. This does not solve the problems of cause, prevention or treatment.

The animal is a 15-months-old mongrel terrier bitch. It was brought into our hospital when only six months old. At that time it was prostrate and extremely toxic. It was impossible to determine what the original infection might have been, for this was obscured by the owner's amateur medication with large doses of flowers of sulphur.

We started the animal on saline and dextrose, as well as plasma intravenously. This was followed by a daily complement of multiple vitamins plus liver extracts intramuscularly. Temperatures varied from the first subnormal temperatures of 99° F. to 105° F. When the animal recovered from the toxaemia and the temperature rose to 103° F., sulphadiazine was used at the rate of 30 grains daily for a period of seven days. Once the temperature had returned to normal the sulpha therapy was discontinued. During the first stage of the hospitalization 250 c.c. of plasma and 500 c.c. of glucose and saline were administered. Multiple vitamins were given for a month.

The animal made a slow but steady recovery. Three weeks after the arrival the first signs of rhythmic twitching of several groups of muscles appeared. In this animal the groups affected are the pectoral, the rectus abdominis and the quadriceps femoris. This can still be seen, and as the muscles contract and relax there is a continued bobbing of the whole animal. The twitch is rhythmic and bilateral and occurs from 60 to 80 times per minute. It persists when the animal is at rest and is aborted when the animal is in motion. The deepest anaesthesia will not prevent it.

Under intensive feeding, and medication with vitamins, the weight and nutrition of the animal was maintained. The twitch remained but in every other respect the animal has been normal for the past nine months. During the period of recovery the animal had a voracious appetite.

This syndrome of rhythmic myoclonic spasm is usually described as chorea, post-distemper encephalitis or disseminated focal myelitis of dogs. In view of the large number of cases, the relative scarcity of typical distemper, and the numerous reports of "breaks" in the vaccination against distemper, we deemed it important to investigate further. During the past nine months we have had 30 such cases. Most of these occurred during the fall. The decrease in the winter may be due to the greater segregation of the animals or the decrease in the purchase of young dogs. Most of the animals affected were between four and eight months of age. No particular breed or sex is more affected than another. The mortality has been about 90 per cent., and in those that do not die, there has been no recovery from the twitch. Very little of typical distemper was seen during this period. The spasms begin from one week to a month after the initial debilitating condition. The muscles affected vary with each animal and may be either unilateral or bilateral. In one case there was an atrophy of the flexor muscles of one leg. In two others there were partial paralyses as well as the spasm syndrome. There seems to be a general weakening and this may be due to the difficulty of co-ordination.

The blood studies show that the R.B.C. average count is 5,460,000 per c.mm. The W.B.C. is about 16,800 per c.mm. and the haemoglobin is about 83 per cent. on the Talquist scale. The differential counts average 70 per cent. neutrophiles, 15 per cent. lymphocytes, 8 per cent. monocytes and 7 per cent. eosinophiles. Blood sugar was 88 mgms. per 100 c.c. of blood while the urea/nitrogen was 15 mgms. per 100 c.c. None of these values is outside of the normal range. The only abnormal change in the urine was in the acid reaction and the slight albumin content.

The *post-mortem* examinations on these affected animals are striking in that there are no visible lesions to account for death. In the three cases where tissues were taken for histological examination, there were no signs of inclusion bodies of distemper and in only one of the brains was there any sign of perivascular cuffing. There were signs of disseminated focal encephalitis and demyelinization.

Dalldorf, an American human-virus investigator, isolated the virus of lymphocytic choreomeningitis from dogs and thought that many of the nervous symptoms in them might be due to a combined action of this virus along with the ravages of the distemper virus. Following this lead, the sera of three were tested for the virus of lymphocytic choreomeningitis by looking for the neutralizing antibody or complement fixing bodies and these all proved to be negative. Due to lack of facilities it has been impossible to test for distemper virus or antiviral bodies. Arrangements are now being made for this work.

In the treatment of the spasm, sedatives have been of no use; sulpha therapy does not affect the course of the disease or lower the temperature, which usually remains between 101° F. and 103° F. Penicillin in amounts up to 100,000 units has no effect. Distemper serum has no effect on the muscular twitch.

The problems which have arisen are many and I should like to review some of them for your thought and discussion:—

1. Is this a single disease entity?
2. Does this syndrome always follow a distemper infection?
3. Is there a superimposed or accompanying virus along with distemper?
4. Can the demyelinization occur as a result of a vitamin deficiency or any debilitating disease?
5. Should this syndrome be taken as evidence of a "break" in the vaccination against distemper?
6. How early should vaccination be started if this is a post-distemper condition?
7. What are the best methods of treatment?

I have come before you seeking material, ideas and information. I feel that this is one of the important disease entities that confronts every veterinarian with a canine practice. The application of the label "chorea" and the recommendation of euthanasia does not solve the problems or enhance the reputation of the veterinary profession.

* Presented by Major Marcus M. Mason, Veterinary Corps, 13th Vet. Sect. Avn., U.S. Army, to the Eastern Counties Division, at Norwich, March 13th, 1945.

REVIEW

[**Principles and Methods of Animal Breeding.** By R. B. Kelley, D.V.SC. (Animal Geneticist, Council for Scientific and Industrial Research; Officer-in-Charge, the F. D. McMaster Field Station; President, N.S.W. Working Sheep Dog Society). Pp. 296, price 15s. Sydney and London: Angus E. Robertson, Ltd. (1946).]

According to the introduction the New South Wales Branch of the Australian Veterinary Association, in conjunction with the Sydney University Veterinary Faculty, is conducting periodic refresher courses for its graduate members and for officers of the Agricultural Department. The subject for one course is to be animal breeding, and Dr. R. B. Kelley, who has been asked to conduct it, has prepared "a concise story of animal breeding as the basis of the lectures" in the hope that the work will prove of interest to many breeders of livestock unable to attend. The scope and lay-out of the book reflect the method of preparation, but the work will doubtless prove of considerable value in all English-speaking countries.

The earlier chapters are devoted to a historical sketch of breed and type origins, with notes upon the methods adopted by well-known figures in the breeding world of bygone days. Relevant biological principles are then reviewed and there follow chapters on phenotypic and genotypic selection, modern animal breeding, animal breeding in Australia, artificial insemination, progeny testing of fine-wool sheep, and current research. An appendix deals with Dr. Sewall Wright's coefficients of inbreeding and relationship. There is the seemingly inevitable admixture of elementary scientific facts and advanced practical points, a criticism which must be shared by almost all courses and course books utilized by agriculturists and veterinarians to-day. The work as a whole, however, provides a fair summary of present-day knowledge and limitations and we can safely recommend its purchase by all interested readers. It cannot be said that it constitutes the much required first text-book of animal breeding for students of animal husbandry, but it will form a useful work of reference for the Animal Husbandry, Part II, course and for the more advanced classes in agricultural schools. The last chapter on current research is thought-provoking and if taken in conjunction with the rest of the book will help to correct the false ideas of those who believe that practical livestock improvement can be speedily and safely brought about by the simple application of Mendelian principles. The striking advances made by earlier breeders, even allowing for the relative ease of their tasks, should have a sobering effect upon those who imagine that rapid advances are now much more feasible than they were a century ago.

The author seems to be a little unfair to his own country in suggesting that it lags far behind others in research on animal

breeding. We have reason to be proud of our Australian colleagues and it will be a welcome day if we can ever hope to provide a refresher course of so extensive and valuable a nature as that indicated by the contents of this book.

ABSTRACTS

Corrigendum.—"Staphylococcosis in Geese"—page 238, May 25th. First line, for "cases" read "outbreaks."

* * * * *

[Variations of Vaginal pH in the Oestrus Cycle in the Mare. Berthelon, M., and Juteau, J. (1945.) *C. R. Soc. Biol.* **139**. 459-460.]

During the 1944 breeding season, the authors studied the daily variations of vaginal *p*H in six mares by colorimetric methods. They found that during di-oestrus the reaction was neutral or slightly alkaline (*p*H 7 to 7·5), increasing slightly in pro-oestrus (up to 8), and rising rapidly during oestrus to a maximum at ovulation of 9 or over. This characteristic increase in alkalinity appears to be due to the action of follicular hormone, since injection of oestrogenic substances into mares during periods of sexual quiescence provoked oestrus and a rapid increase in alkalinity of the vagina.

E. C.

* * * * *

[The Immunization of Foxes and Dogs to Distemper with Ferret-passage Virus. Green, R. G., and Carlson, W. E. (1945.) *J. Amer. vet. med. Ass.* **107**. 131-142. (18 refs.).]

Many species of the canine and weasel families are susceptible to distemper, but the disease is of practical importance principally in relation to dogs and foxes. The theory that the causative agent of distemper is a filtrable virus was advanced by Carré early in this century and became firmly established in consequence of the work of Puntoni, Laidlaw and Dunkin, and Lebailly shortly after 1920. These investigations were directed towards demonstrating the nature of the causal agent and to the development of a vaccine. Puntoni showed that formolized virus from infected brain conferred an active immunity and his researches were extended by Laidlaw and Dunkin. The latter workers showed that formolized ferret spleen produced immunity in the ferret but not in the dog, though formolized dog spleen would produce immunity in the dog. As the immunity produced by the latter vaccine was transient, they introduced the method by which dogs were immunized with this vaccine followed by viable vaccine. They also produced in dogs hyperimmune serum for protective and curative treatment.

The authors' work was primarily directed to the study of distemper in silver foxes. They sought to produce a viable vaccine for dogs and foxes by numerous passages in the ferret of a strain of virus which was originally virulent for canines. After 50 such passages a virus was obtained which had attained a high constant virulence for the ferret. This vaccine caused no untoward reaction in foxes but in dogs a slight malaise resulted in a few cases. In both species it produced a high degree of immunity against natural infection. Indeed, the immunity of dogs was tested in some cases by simultaneous contact exposure and inoculation of virus. These experiments showed that the resistance of dogs to infection was greater at two months or longer after immunization than at five weeks. It was further shown that a relatively large dose of vaccine produced more uniform results without increasing the severity of the vaccination reaction and that their viable vaccines when injected into passively immunized dogs produce active immunity in a few animals only.

A. W. G.

COW THAT WILL NOT GO DRY

Commenting on the recent visit to Thames Ditton of Mr. A. Ward, Director of Herd Improvement in the New Zealand Dairy Board, *The Home Farmer* (the journal of the Milk Marketing Board) says that it provided an opportunity to confirm reports that have appeared in print of a remarkable New Zealand cow that refuses to go dry. For six years she has had no calving and during this time she has yielded 3,678 lb. butterfat (equivalent to 9,190 gallons at 4 per cent.). "The story is absolutely true—the cow is in the herd of the Chairman of the milk records movement and Mr. Ward knows her well. Her lactation curve each year goes up in spring in the normal way, drops in winter and comes back again the following spring.

"She is now famous and is a subject of great interest to students of lactation throughout the world. No-one has yet succeeded in understanding why she behaves in this way and, therefore, how other cows might be encouraged to follow suit. An extreme case very often draws attention to a new principle."

QUESTIONS IN PARLIAMENT

Penicillin (Distribution)

Dr. Barnett Stross asked the Minister of Health whether he has any further statement to make on the forthcoming retail distribution of penicillin; whether he will take steps to advise the public that penicillin does not cure the common cold or tuberculosis or many other constitutional ailments; and whether he will make it known that efficient treatment for serious disease may be jeopardized by taking small doses of penicillin indiscriminately.

Mr. Bevan: My right hon. Friend the Minister of Supply informs me that he has not yet completed his arrangements for the distribution of penicillin. The arrangements will provide that, for the present, penicillin will be available to the public only on the prescription of a qualified practitioner, and that should be a safeguard against the dangers my hon. Friend has in mind.

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Penicillin Treatment (Dairy Cows)

Mr. W. Roberts asked the Minister of Agriculture what supplies of penicillin are available for the treatment of dairy cows.

Mr. T. Williams said that there were sufficient supplies of penicillin for approved research for veterinary purposes, but until the extent of the demand for human needs was known he was afraid that it would not be possible to indicate what supplies would be available for the treatment of dairy cows generally.

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Training Schemes

Major Legge-Bourke asked the Minister of Agriculture how many applications have now been received from men and women in the Services and since release for the agricultural and horticultural training schemes; how many have actually begun training; and how many are accommodated collectively and by boarding out.

Mr. T. Williams replied that up to April 30th this year, 2,715 applications from men and women had been received. Of this number 2,026 had actually started training. Those figures covered both farm and institutional training. The larger proportion of those engaged in farm training were boarded out, but precise figures were not available. Almost all those taking institutional training were accommodated collectively.

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Pigs and Poultry

Colonel Ropner asked the Minister of Agriculture if he will give an estimate of the prospective decline in the pig and poultry population of this country which will result from maintaining the present decreased rations for such livestock.

Mr. T. Williams replied that no reliable estimate could be made of the prospective decline in the pig and poultry population which would result from the reduction in rations of feeding-stuffs which came into effect on May 1st, nor from that which would operate from July 1st. During the war the decline in numbers was much less proportionately than the reduction in supplies of rationed feeding-stuffs, and he hoped that producers would again make every effort to maintain livestock production both by increasing their own self-sufficiency in feeding-stuffs and by making the greatest possible use of swill and other unrationed feeding material.

NATIONAL PARK FOR TANGANYIKA

The Dar-es-Salaam correspondent of *The Times* reports that the Government proposes to introduce legislation to create a national park in the Ngorongoro-Serengeti area of the Northern and Lake Provinces; it is probable that the management and control will be vested in a board of trustees, comprising officials and non-officials.

The Serengeti area is famous for lion and many rare species of gazelle, as well as great quantities of other game, and, through the nature of the country, is probably the finest in the world for viewing and photographing animals. The area covers several thousand square miles from near Arusha to the shores of Lake Victoria.

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To obviate the many enquiries received for information as to the locality of the nearest stallion, the National Horse Association of Great Britain and Ireland has compiled a list from information sent in by owners of light horse and pony stallions available for service this year at a service fee not exceeding 20 guineas. Copies, price 6d. plus postage, may be obtained from the N.H.A. on application to 43, Russell Square, London, W.C.1.

NOTES AND NEWS

Diary of Events

June 1st.—Meeting of the Society of Women Veterinary Surgeons, at the Conway Hall, Red Lion Square, London, W.C.1, 2.30 p.m.
June 4th.—R.C.V.S. Annual General Meeting.
June 4th.—R.C.V.S. Committee Meetings.
June 4th.—Annual General Meeting, Victoria Veterinary Benevolent Fund, 10, Red Lion Square.
June 5th.—R.C.V.S. Committee Meetings.
June 6th.—R.C.V.S. Committee and Council Meetings.
June 6th.—Visit of the Central Veterinary Society to Northaw and the White City (see Notice).
June 7th.—A Quarterly Meeting of the South Wales Division, N.V.M.A., at the King's Head Hotel, Llandilo, 2.15 p.m.
June 7th.—A Field Day with the Milk Marketing Board's Artificial Insemination Centre, Cheswardine, Nr. Market Drayton, Salop, 2 p.m.
June 13th.—Summer Meeting of the South-Eastern Division, N.V.M.A., at the Wellcome Research Station, Ely Grange, Frant, Nr. Tunbridge Wells, 11 a.m.

THE FOLLOWING IS THE PROVISIONAL PROGRAMME FOR N.V.M.A. COUNCIL AND COMMITTEE MEETINGS IN JUNE IN EDINBURGH

WEDNESDAY, JUNE 19TH
11 a.m.—Finance and General Purposes Committee.
2.30 p.m.—Sub-committee on First Aid Handbook.

THURSDAY, JUNE 20TH
10 a.m.—Appointments Committee.
11.30 a.m.—Organising Committee.
2.15 p.m.—Joint Veterinary Officers, Public Health and Parliamentary Committee.

FRIDAY, JUNE 21ST
11 a.m.—Council Meeting.

Would members wishing accommodation reserved in Edinburgh hotels notify the General Secretary, N.V.M.A., 36, Gordon Square, W.C.1, *without delay*, giving dates.

June 27th.—R.C.V.S. Written Examinations begin.
July 1st.—R.C.V.S. Oral and Practical Examinations commence.
Sept. 23rd-27th inclusive.—Annual Meeting and Conference of the National Veterinary Medical Association of Great Britain and Ireland, to be held in London.

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PERSONAL

Marriage.—BRYDON—COPPER.—The wedding took place at Christ Church, Harrogate, on May 23rd, 1946, of David Arthur Dempster Brydon, M.R.C.V.S., only son of Mr. and Mrs. A. D. Brydon, of Spofforth, and José Kathleen, younger daughter of W/Cmdr. and Mrs. E. E. Copper, of Harrogate.

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R.C.V.S. OBITUARY

The Late David Brown, M.R.C.V.S.

KILWINNING, AYRSHIRE

We have received the following appreciation from the Ayrshire Division, N.V.M.A.: "David Brown qualified in 1894 and soon after took up practice in Kilwinning, Ayrshire. Here he remained till he retired from active practice. He was one of the founders of the Ayrshire Division of the National and was its Secretary from 1922 till his death in March, 1946. Always a keen 'National' man, his enthusiasm held the Division together throughout the years and it was in a great measure 'his' Division. A meeting without him will seem incomplete.

He also found time to take a great interest in church affairs and was an elder of his local church for 15 years, representing it on the presbytery.

His funeral was attended by representatives of the Scottish Branch and the West of Scotland and Ayrshire Divisions of the National as well as by very numerous private mourners, showing how universal was the liking held for David Brown."

The Late Sydney James Dickson, M.R.C.V.S., M.R.C.S., L.R.C.P.

A TRIBUTE

Mr. J. F. A. Sprent, of Veterinary Laboratories, New Haw, Weybridge, writes: "I would be glad of a little space in your next issue of *The Veterinary Record* to express my sorrow at the death of my old friend, Sydney James Dickson, M.R.C.V.S., M.R.C.S., L.R.C.P., who died from pneumonia at the Radcliffe Infirmary, Oxford, on March 13th, at the early age of 29. I first met him at the Royal Veterinary College, London, in 1935, and since that time he has been one of my most intimate friends. His gentle, sensitive but tolerant personality and his acutely observant mind made his company always a pleasure. At College he formed part of a circle of friends who, though now widely separated, will remember him with affection. My wife and I will always remember with affectionate gratitude his loyalty and readiness to help and we wish to extend our sympathy to his family and all those friends who mourn for him."

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ROYAL (DICK) VETERINARY COLLEGE

APPOINTMENT OF PRINCIPAL

Confirmation has now been received that Professor W. M. MITCHELL, M.C., T.D., M.B., CH.B., B.SC. (EDIN.), has been appointed Principal of the Royal (Dick) Veterinary College, Edinburgh. The appointment dates from October 1st, 1946.

Professor Mitchell will continue to hold his post as Professor of Surgery and Obstetrics at the College.

We hope to publish a fuller biographical note in a later issue.

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ROYAL SOCIETY OF ARTS

PRESENTATION OF THE ALBERT GOLD MEDAL

The Albert Gold Medal of the Royal Society of Arts, which was struck in memory of the Prince Consort in 1864, has been conferred by the Society this year on Professor Sir Alexander Fleming and Professor Sir Howard Florey as a joint award for their services in the discovery and development of penicillin. The terms of the award and details of the arrangements to be made for the presentation of the medals will be announced later.

UNIVERSITY OF CAMBRIDGE

THE JOHN LUCAS WALKER STUDENTSHIP

The John Lucas Walker Studentship for original research in pathology has been awarded to Mr. R. R. A. Coombs, B.SC. (EDIN.), M.R.C.V.S., of Trinity Hall.

ELECTION OF PRESIDENT OF THE GUILD OF UNDERGRADUATES, LIVERPOOL UNIVERSITY

Members of the profession will be interested to learn that the student body of Liverpool University—the Guild of Undergraduates—has elected a veterinary student, J. K. Walley, as its President for the year 1946-47. Mr. Walley is at present a fourth year student and is Honorary Secretary of the Veterinary Society.

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R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

LIST OF SUCCESSFUL CANDIDATES

(*Continued from page* 242)

LIVERPOOL:

Bacon, William.
Brears, W. S.
Cayless, Miss G. B.
Cole-Powney, J. H. M. (Credit).
Cundle, Miss E. C.
Davies, E. L. (Credit).
Earl, N. M.
Fisher, Miss P. M.
Forster, P. E. (Credit).
Forster, R. (Credit).
Grime, P. A.
Hooper, Miss G. M.
Horn, B. S.
Humphries, Miss S. M.
Keeble, S. A. (Credit).
Mason, H.
Maydew, Eric.
Morgan, W. J. B.
Parkinson, W. G.
Parry, R. T.
Perry, P. F. (Credit).
Roberts, Miss E. G.
Smith, Miss M. B. (Credit).
Stevens, A. J.
Teer, J. P.
Thomas, E. A.
Woodhead, A. T.

DUBLIN:

Connors, Michael.
Corr, John.
Downer, N. E.
Doyle, J. F. J.
Fanning, J. J. (Credit).
Geraghty, M. P.
McGettigan, J. F.
Murphy, J. J.
O'Brien, M. G. (Credit).
O'Kelly, C. D.
O'Riordan, Miss Mary.
Pentland, W. H.
Prendiville, D. B. (Credit).
Reilly, Raymond.
Rosney, P. C.
Ryan, G. M.
Stephenson, J. A.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Caernarvonshire.—Caeau Uchaf, Deinioten, Caernarvon (May 27th).
London.—130, Weston Street, Bermondsey, London, S.E.1 (May 27th).

Yorks. (*W.R.*).—Piggeries, Rydal Avenue, Stocksbridge, Sheffield, Yorks. (May 24th); "Willow Dene," High Street, Norton, Doncaster, Yorks. (May 27th).

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TRIBUTE TO THE MULE

Since Gilbert Chesterton "in letters of gold" recalled the pre-eminence of the humble ass, probably no more effective plea for recognition of animal service has been made than in the recent *Times* "light leader" reproduced here. "It has been suggested," says that august but occasionally happily sentimental organ, "that a place of honour in the Victory Parade should be reserved for the mule, who served with such distinction in the Burma campaign and, among other places nearer home, at Casino. If everyone and everything that deserved to join in the procession could do so, the streets of London would not be long enough to hold them, but not only animal-lovers will endorse the special claims of the mule. Indeed the animal lover may even be indifferent to the idea, for loving animals has a way of defining itself as loving only those animals human beings happen to find attractive. Dogs, cats and horses certainly; cows and white mice, perhaps, but mules, although they bear a clear relationship to the friend of man, are unlike Smee in that people do not think them lovable. Kipling, it is true, appointed himself their laureate, but he hymned them in verse which had something of the iconoclastic violence of the mule's own kick. The gentler lyricism is plainly not their pail of water. The prose in which, for instance, E. V. Lucas communed with Pekinese, the lines, redolent of cosy domesticity and firelight flickering on the walls, which Harold Monro addressed to 'the little black cat with bright green eyes' are clearly not suitable for them. They have their uses, but no part among the pleasing decorations of life.

"Obstinacy is not one of the more obviously attractive qualities, and it as natural to think of obstinacy in terms of mules as of long memory in terms of elephants. The power and associations of words are peculiar, however, and while we are prone to pride ourselves on our strength of mind, we resent being called obstinate. And yet the two can mean much the same thing. It is often obstinacy which encourages a man to persevere in what seems a forlorn and desperate hope, and if the mule can lay his ears back and dig in his heels, he can also march forward with a neat sure-footedness over country which seems impossible. He, the outcast and despised, can go where all the vast and intricate mechanical inventions of man are powerless to move, and a war which saw rocket projectiles crossing seas and penetrating the stratosphere at a speed far greater than sound was not above relying in some measure on a method of transport slow, primitive, and proved by the years. The horse has seen his glory fade since the opening days of the century, and cavalry now means mechanized cavalry, but the mule in 1945 did the work he was trained to do when the Soldiers Three were young recruits. If the mule finds his way into the procession on June 8th there will be 'a soundless clapping host' of the shades of old soldiers glad to pay their ancient friend and enemy the tribute due to him."

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POULTRY BREEDING CONTROL

Congestion in the Government's law-making programme will hold up legislation for the compulsory control of poultry breeding stock, hatching eggs and day-old chicks, it was reported at a recent meeting of the N.F.U. Council. The Ministry, which had been asked to act at once, had told the Union that the matter would, however, be "kept under review."

Scottish Accreditation Scheme

A Register of accredited poultry breeding stations in Scotland is to be compiled and issued by the Department of Agriculture for Scotland. The object of this Register is to provide information as to reliable sources from which stock, including ducks and turkeys, of good quality may be obtained with a minimum of risk as regards disease. The inclusion of a poultry breeding station in the Register shows that it has been approved as suitable for the production and distribution of healthy stock of high quality and that the stock on the station has been blood-tested in accordance with the Department's regulations.

Poultry breeders who wish their names to be included in the Register must comply with the prescribed regulations, particulars of which, together with forms of application, may be obtained from: The Secretary, Department of Agriculture for Scotland, 15, Grosvenor Street, Edinburgh, 12. Applications for accreditation should be submitted to the Department on the appropriate form not later than May 15th, 1946.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Progress of Official Milk Recording.—Official milk recording in England and Wales shows an increase of 2,553 herds over last year's figures. Recording is most advanced in the south-eastern region, where 31 per cent. of the total herds are recorded. If 31 per cent. of the dairy herds of the whole country were brought into recording the total recorded herds would number over 50,000 instead of the 17,423 now recorded.

More Reared Calves—More Store Cattle.—Good store cattle are in short supply and prices are consequently high. Now that the price of the finished article is guaranteed, the demand for good class stores is likely to be even greater. The solution to the problem lies in the rearing of more calves. At present too many bull calves, suitable for carrying on as stores, are being killed. If every farmer who is already rearing calves would carry two or three more and if farmers who have facilities for calf rearing would do so, the store cattle population of the country would show a marked increase within the next two years.

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D.D.T. killed arsenic-resistant ticks and buffalo flies in experiments conducted by the Central Coastal Graziers' Association in conjunction with the Australian Council for Scientific and Industrial Research. A 100 per cent. kill of ticks was obtained when heavily infested cattle were sprayed with 2 per cent. D.D.T. When cattle were inspected nine days after spraying, no live ticks were found. After the cattle had been turned back to their own paddocks, they were not reinfested up to four weeks.—*Reuter.*

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APPOINTMENTS IN SOUTHERN RHODESIA

It is understood that the Government of Southern Rhodesia will shortly advertise a number of vacancies in the Veterinary Branch of its Department of Agriculture and Lands. The Association has been unable to accept for insertion in *The Veterinary Record* an advertisement of these vacancies because the scale of salaries to be offered and certain of the terms of appointment are regarded as unsatisfactory. Members of the profession who may be tempted to apply for these posts are consequently advised to communicate with the General Secretary, N.V.M.A., 36, Gordon Square, London, W.C.1, in the first instance.

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R.A.V.C. RELEASES

The Times reports that the following further programme for releases of R.A.V.C. Officers, excluding Quartermasters, has been notified: Group 48—June 16th to July 31st, 1946; Group 49—August 1st to 31st; Group 50—September 1st to 30th.

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Whitsun Holidays

The London offices of Burroughs Wellcome & Co. will be closed from 5.30 p.m. on Friday, June 7th, to 9 a.m. on Tuesday, June 11th. A skeleton staff will be in attendance on Monday, June 10th, at 12, Red Lion Square, W.C.1, to deal with urgent orders.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange•	Sheep Scab	Swine Fever
April 16th to 30th, 1946 ...	4	2	—	—	26
Corresponding period in—					
1945 ...	6	10	1	4	44
1944 ...	11	—	—	—	33
1943 ...	10	—	—	2	20
Total Jan. 1st to April 30th, 1946 ...	41	22	4	34	218
Corresponding period in—					
1945 ...	43	73	5	37	375
1944 ...	86	19	5	58	214
1943 ...	118	10	5	94	188

Note.—The figures for the current year are approximate only.
• Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at April 30th, 1946, was as follows:—

England	Wales	Scotland	Total (Great Britain)
5,760	9,681	6,328	21,769